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PRINCE OF WALES' RELIEF FUND.

This week's issue contains—as will some future ones—a coupon for subscribers to the Prince of Wales' National Relief Fund. Very few words wil. suffice to commend this Fund to the professionl Nothing need be said of the duty of subscribing towards the alleviation of distress caused by the war—that is an obligation which every veterinary surgeon will recognise. But a word may be said upon one point which renders the Prince of Wales' Fund especially worthy of our support. Many movements have already been set on foot in the kingdom, all, in one direction or another, designed to lessen the suffering of war. For the most part they are independent of one another, and their activities probably often overlap and may not always be wisely directed. Some of them, at least, are possibly even now neglecting really necessary for comparatively unimportant work. But we believe that the Prince of Wales' Fund is already well officered and organised; and we know that its directors, having access to official sources of information, will be well able to judge in what directions effort and expenditure are most needed. We may support this Fund with full confidence that our money will be wisely spent.

THE DRUG MARKET.

One of the many serious effects of the war has been to raise the price of drugs. That effect is very marked at present, and will become still more so for a time, after which there will probably be a return towards the normal. It is due partly to the heavy demands made upon the drug firms by the Army and Navy, but much more to the stoppage of Continental sources of supply. Germany and Austria-Hungary supply so much of our raw drug material, and Germany in particular so many synthetic products, that there must be a serious shortage for a time.

The Government have taken the question in hand; and its difficulties will not be insuperable, Other sources of supply for our crnde drugs already exist, and will be developed; and some English and American firms in particular will soon be able to furnish nearly all the synthetic preparations we need. Meanwhile, both medical and veterinary practitioners should avoid "panic buying" of drugs as they do that of food. Large orders of certain drugs will help to make prices prohibitive. Moderate ordering, and certain discriminatory precautions—such as the frequent substitution of sodium for potassium salts—will aid in keeping the prices down till the new sources of supply open.

INFECTIOUS CORYZA OF FOWLS.

G. Vallillo, of Milan, describes (*La Clin. Vet.*) an infectious disease of fowls which has prevailed for some years in the Lago di Lecco district. It takes the form of a catarrhal affection of the upper air passages; and, in consequence of its high mortality, especially among the younger birds, it causes considerable damage to poultry-breeders. Favorolles, Rhodes-Islands, and Orpingtons are among the most susceptible breeds. The native Italian breeds are susceptible, but not to the same degree. Other kinds of birds, such as pigeons and turkeys, are not affected.

The disease begins with snuffling, and the appearance of a nasal discharge. This discharge is thin and scanty at first, and afterwards constantly becomes thicker and more copious, It is slimy, mixed with flakes of fibrin, and dries easily. It has an unpleasant and characteristic odour, resembling that given off by a bathed dog. In a short time it increases in quantity to such a degree that it is pressed back through the nares, so that the birds can only breathe through the beak, At this stage the mucous membrane of the pharynx and larynx is also covered with exudate, the breathing becomes hoarse and rattling, and loud enough to be heard at a distance. Many birds also show the symptoms of a fibrinous conjunctivitis, and collections of exudate in the orbital cavity—sometimes there are similar collections in one or both suborbital cavities. This leads to the formation of swellings around the eye or in the region between the base of the lower eyelid and the commissure of the beak. In addition to these symptoms there are disturbances of the general condition and a high degree of emaciation.

As a rule, the disease ends with death after a duration of from six weeks to three months. Only adult, strong, and well nourished birds recover without serious damage.

The microscope reveals a considerable infiltration of the affected mucous membranes by leucocytes, among which eosinophilous cells predominate. Necrotic processes are absent; and this fact, and the ease with which the dried masses of exudate can be removed from the subjacent tissue, differentiates the disease from avian diphtheria.

The cause of the disease is a short ovoid bipolar bacillus, which is often united in chains of two or three together. It grows upon agar, or still better upon stiffened blood-serum, in the form of small, shining, transparent, dew-drop like colonies. This bacillus is found almost in pure culture in the pathological products of the mucous membranes of the head, but *not* in the blood, To all appear-

ance it is a variety of the *Bacillus avisepticus*. When transferred to healthy fowls in a proper manner and in sufficient quantities, it produces the disease with all its characteristic symptoms.—(*Berliner Tier. Woch*).

Spirochætæ in Papillomatous Neoplasms in Horses.

M. Caspano records (*La Clin. Vet.*) the two following cases. The first was an Abyssinian horse, in which the author found, in the upper and lower conjunctival sacs and upon the membrana nictitans of the right eye, small cauliflower-shaped papillomata, which contained numerous spirochætæ of different forms and dimensions. The rest of the conjunctiva was hyperæmic and infiltrated, and in some places even granulated and covered with small ulcerations.

A moderate degree of swelling of the sub-maxillary glands was also present at the same time. In other respects the horse was completely healthy.

The second case was an Italian Army horse, which showed symptoms causing a suspicion of glanders. Spirochætæ, agreeing in appearance with those found in the first case, could be demonstrated in the nasal discharge.

The mallein test and the bacteriological test proved the horse to be free from glanders, and the symptoms he had shown soon disappeared and a more accurate examination of the nasal mucous membrane for neoplasms such as those found in the first case was not possible.

The author is uncertain whether the spirochætæ he found stand in ætiological relationship to the formation of papillomata, or, if they do, how great their influence may be. But he regards it as certain that affections of the mucous membranes characterised by papillomatous neoplasmata containing different forms of spirochætæ, occur in horses, and that these lesions may cause symptoms clinically resembling those of glanders.—(*Berliner Tier. Woch.*)

The Secretion of the Kidney.

Dr. Erich Leschke has published (*Münchener Medizin. Woch*) an article upon this important and still controversial subject. After a short review of the existing literature upon it, he proceeds to an account of his own researches. He has devised special histo-chemical methods by which the normal constituents of the urine, such as sodium chloride, urea, phosphates, uric acid, and the purin bodies may be demonstrated in sections. After describing these methods, he details the results he has attained by them. He found the same conditions in all the sections he examined.

The glomeruli contained either none of these salts, or traces so small as to represent, at the highest, the concentration of a physiological salt solution. On the other hand, the epithelial cells of the renal tubules, and the tubules themselves, were filled with urinary constituents made visible by the author's histo-chemical methods. The major part of the secretion was going on in the convoluted tubules, but the transitional portions between these and the straight tubules also showed a distinct secretion. The same results were seen in sections cut to investigate the excretion of substances foreign to the body, such as potassium iodide.

The author arrives at the conclusion that the renal secretion of even enormously large quantities of salts is effected by the renal tubules alone, and that the glomeruli only secrete water (in the form of a physiological salt solution).

In diseased kidneys, where the urinary tubules were severely damaged, the author found the salts in the lymph surrounding the tubules.—(*Münch. Tier. Woch.*)

Histological Examination of the Salivary Glands in Rabies.

Manguèlian has been histologically examining the salivary glands of rabid dogs, and has found them to contain great quantities of Negri's corpuscles.

The Negri corpuscles were found in the cytoplasm of the nerve cells of the intra-glandular ganglia, but never in the epithelial cells of the acini or canals.

The cells of the acini were, however, greatly altered; and their residues were destroyed by the fixed macrophages. The saliva itself was found to consist of cells from the acini and ducts, some macrophages, and amorphous masses which were stained blue by Unna's polychrome blue and violet by Mann's staining method.—(*Münch Tier. Woch.*)

W. R. C.

THE CHILLED BEEF AND FROZEN MEAT ESTABLISHMENTS IN THE ARGENTINE.

Report, Sanitary Committee.

To the Right Honourable the Lord Mayor, Aldermen and Commons of the City of London, in Common Council assembled.

It will be within the recollection of your Honourable Court that on the 24th July last (1913) you permitted your Veterinary Surgeon, Mr. T. Dunlop Young, M.R.C.V.S., to accept the invitation of the Argentine Government to visit the chilled beef and frozen meat establishments in the Argentine on the following conditions:—

1. That no public expression of policy or advice be expected by the Argentine Government or be given by Mr. Young.

2. That no report be expected by the Argentine Government from Mr. Young, but that he should on his return submit a report of a private character, the publication of which, or any parts thereof, or the transmission thereof, or any extracts therefrom, to the Argentine Government, should be entirely at the discretion of your Honourable Court.

We have now had before us a very able and interesting report from Mr. Young together with a memorandum thereon by your Medical Officer of Health, which we herewith submit, and which we recommend should be printed and circulated for the information of the members of your Honourable Court and others, and a copy thereof forwarded to the Local Government Board.

We have also to report that, in addition to the establishments in the Argentine, Mr. Young visited the La

Plata works in the Uruguay, which carry on a considerable trade in meat with this country, and we have authorised the payment of his expenses in connection therewith, viz., £4 15s.

MEMORANDUM BY THE MEDICAL OFFICER OF HEALTH ON THE REPORT OF THE VETERINARY SURGEON RESPECTING HIS RECENT VISIT TO ARGENTINA. [ABSTRACT].

In a report (1913) I drew the attention of your Committee to the fact that practically the only complaints which have been received respecting Argentine meat were those of the City Corporation. These complaints probably resulted from the fact that in London more cutting up of butchers' joints takes place than perhaps in any other centre, which process really amounts to increased inspection.

The report by Mr. Young deals with the following matters:—

(*a*) Importance of the Argentine dead meat trade, from which section it will be seen that South America supplies 82·6 per cent. of all beef imported into this country.

(*b*) Particulars are given as to the different Frigorificos.

(*c*) A description is given of the chief buildings and surroundings. Some criticism is submitted in this section in respect of details such as the approaches to the slaughterhouses, the structure of certain accessories, the question of cleanliness, and the relationship to one another of the premises in which the different processes are carried out.

(*d*) The freezing and chilling rooms. Landing of meat into steamers. Transporters and the provision of the cool rooms on board the vessels; all received attention.

(*e*) Methods of slaughter are considered and the method of cleansing carcases which is described on page 15 is worthy of note.

(*f*) The method of disposal of offal is set out in detail.

(*g*) The inspection of meat as conducted in the Frigorificos is considered on page 20 to 26; and in this connection it should be noted that although there has been a considerable increase in the number of inspectors in recent years, the total staff is only just sufficient for the purpose. The increase referred to, however, shows that the Government is alive to this requirement.

It should be noted that the assistant inspectors are men selected from practical butchers when they can be obtained. They, however, hold no certificate as a proof of the knowledge of the duty entrusted to them.

The inspectors are all veterinary surgeons.

(*h*) The chief diseases coming under observation, as well as the method of dealing with carcases and organs affected with disease, are dealt with.

In this latter respect the method of using different coloured skewers in either the vertical or horizontal position to indicate different lesions, is ingenious and worthy of note. This is set out on page 25. This system, if properly carried out, gives valuable information even if the organs cannot accompany the carcase throughout the whole inspection.

(*i*) The inspection of meat used in the Canning industry is set out on page 26.

Appendices are added which include a statement by Dr. Suarez respecting the qualifications of meat inspectors and the special instructions which are given to them; some description of the future prospects of meat supplies; a translation of the different regulations which are in operation in the district; and the recommendation by Mr. Young respecting the advisability of a representative of the English Government being located in a suitable centre in this meat-producing area.

In connection with this latter subject I would desire to state that I am of opinion that the appointment of such an inspector would be of value.

It should be remembered that when the meat arrives in this country only the carcase is available for examination, and a considerable amount of confidence requires to be placed in the methods adopted in the country of slaughter. The suggestion does not in any way throw any doubt upon the character of that inspection, but I think it would be of advantage to both the importing and exporting countries if the services of such an officer were available. It is well known that meat inspection in this country is far from being uniform, and it is not difficult to recognise a possible objection in respect of the inspection of foreign meat if at any time it should be desired to raise the standard of the home inspection.

Apart from this aspect of the case much useful information could be gained, as is pointed out by Mr. Young, by an English veterinarian being located in the centre of a meat-producing district. Matters of scientific interest are constantly arising, and also are subjects of administrative concern.

I am of opinion that the suggestion might well be made the subject of a reference to the Local Government Board.

It is not necessary to enter more fully into the details of the report, but to express the opinion that the experience gained by Mr. Young will prove of great service to the Public Health Department in the work of meat inspection, which is one of the most important branches of work that department has to perform.—I have the honour, etc., etc.

WILLIAM J. HOWARTH,
Medical Officer of Health.

REPORT OF T. D. YOUNG, M.R.C.V.S.

Meat Inspector's Office,
503-4 Central Markets, Smithfield, E.C.
March, 1914.

To the Worshipful the Sanitary Committee.

Gentlemen,—I herewith submit to you a report and appendices* dealing with the methods adopted in preparing meat for human consumption, from the time the animals arrive at the Frigorificos until the meat and offal arrive in this country.

On arrival at Buenos Aires, I was met by Dr. Suarez, representing the Argentine Minister of Agriculture, and the Secretary of the British Legation, representing Sir Reginald Towers. Both of these gentlemen were untiring in their efforts during the time I was in the Argentine Republic, and rendered your officer every assistance.

After being introduced to the Minister of Agriculture and the officers of the Rural Society (equivalent to the Royal Agricultural Society of Great Britain) also the President and officials of the League Agrarian, all of whom are interested in the exportation of meat and the breeding of cattle, I commenced the work which I had been invited to perform, namely, to view the work of meat inspection as conducted at the Frigorificos in Buenos Aires, Campana, and Zarate.

It is of interest to consider here the importance of the Argentine dead meat trade of the Argentine Republic and how necessary it is that the Corporation of the City of London should be satisfied that the meat arriving within its jurisdiction is prepared for human consumption under hygienic conditions, is carefully inspected as to freedom from disease, and is conveyed from the place of slaughter to the Central Markets, Smithfield, in a satisfactory manner.

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*Appendix 1. Statement by Dr. Suarez, 2. Sanitary Regulations. 3. Regulations for Cold Stores, etc. 4. Future prospects of meat supplies. 5. A suggestion.

During the year 1913 the imports into Great Britain from various countries were as follows :—

Chilled Beef.	South America	Cwts.	5,248,004
	U.S. of America		1,462
	Canada		6,555
		Total	5,256,021
Frozen Beef.	South America	Quarters	1,405,342
	Australia		1,084,832
	New Zealand		126,750
		Total	2,616,924
Frozen Mutton and Lamb.	New Zealand	Carcases	5,673,624
	Australia		4,425,517
	South America		2,820,024
			12,919,165

Percentages of Meat Imported.

Country.	Beef.	Mutton & Lamb.	Pork.
Argentine Republic	82·60	22·20	—
Australasia	17·30	72·43	—
Belgium	—	—	1·75
Holland	—	2·30	92·77
Other countries	·09	3·07	3·06
U.S.A.	·01	—	2·42

The weight of chilled beef from the Argentine Republic in 1913 exceeded the weight of that sent in 1912 by 66,822 tons or 34·4 per cent.

The Argentine Republic is favoured with a splendid climate, during winter animals never require to be placed under shelter, and there exists abundance of grass on which cattle and sheep fatten ready for the market without any additional food. Alfalfa, when sown, is an ideal food, being equal to grass and grain, rich in fattening properties. When allowed to grow untrampled by animals it can be cut for hay five times a year, and in good seasons even more often. The Estancios of Argentina in general are very large, many of them extending to miles in length and breadth. In order to provide against droughts, wells have been sunk, and water is pumped by wind power into large tanks. From these the water is supplied to the animals, and it can be allowed to flow over acres of level land.

Great attention has been given to improving the breed of cattle. Differences of opinion exist as to the best animals with which to cross Argentine cows. From observations, the Durham or short horn breed seems to be the favourite, with Herefords a good second, and Angus Aberdeen next. During 1913, 1448 head of cattle, averaging over £100 per head, were imported from Great Britain into the Argentine Republic. It is a sight never to be forgotten to observe from a train thousands of cattle roaming knee deep in alfalfa over thousands of acres of level land. The animals require little attention, nature acting as caretaker.

The majority of the fat cattle are produced within a radius of twenty to one hundred and fifty miles of the Frigorificos, and the animals are transported by means of railway waggons to their destinations. Instead of being driven, so many into each waggon through a door at the side, as in this country, they walk through the end of one waggon, doors are left open at each end of long rows of waggons, and the cattle file along from waggon to waggon as if in a corridor train. As soon as each waggon has its complement, the doors at each end are shut. In this way it is much easier both to load and unload the animals. Sheep are carried in double-decked waggons.

The number of cattle in the Argentine Republic is said to be 29,116,625, whether that number which was shown by the census of 1908 is being maintained seems doubtful. Another census will be taken during 1914.

FRIGORIFICOS AND OWNERS IN ARGENTINA.

Title and Situation.	Owners.
Sociedad Anonima La Blanca Company, Buenos Aires (Province)	Messrs. Morris Messrs. Armour and Co. (U.S.A.)
Campania Sansinena de Carnes Congeladas, Buenos Aires (Province).	A native firm.
Sociedad Anonima La Plata Company, Gran, Dock Port of Buenos Aires.	Swift Beef Company (U.S.A.)
River Plate Fresh Meat Company, Campana.	English firm.
The Las Palmas Produce Company, Ltd., Zarate.	J. Nelson and Sons.
The Smithfield and Argentine Company, Ltd., Zarate.	English firm.
Frigorifico Argentine Company Buenos Aires (Province).	Native firm (now taken over by Messrs. Sulzberger Bros. of U.S.A.)

NEW FRIGORIFICOS.

Title and Situation.	Owners.
Messrs. Armour and Company, USA now building adjacent to Messrs. Swift's factory at Gran.	
Union Cold Stores Company, Ltd. (of London), Building at Zarate.	English firm.

Although not invited to visit Uruguay I took the opportunity of visiting Monte Video and obtaining information as to the two Frigorificos there, from which meat is exported to the City of London. These are :—

Title and Situation.	Owners.
Frigorifico Uruguay, Monte Video.	Sansinena Company (South American).
Frigorifico, Monte Video	Swift Beef Company (U.S.A).

As it would necessitate a very long report to deal with each set of premises, I have reported on them in general terms, as they are, with a few exceptions, built and conducted on somewhat similar lines.

BUILDINGS.

In most cases there is no paving surrounding the buildings nor on the approaches to them, engine ashes being used. This material, mixed with horse and cattle manure, in dry weather and on days when there is a strong wind blowing, is an objectionable feature, as the dust, etc., is blown throughout the works where the carcases are being prepared for human consumption. In one place the paving surrounding the buildings was very good, being of granite setts, and a system of electric trolleys is in use for the conveyance of goods to and from the ship's side, thus obviating the use of horses and the objection of horse manure being blown about. It is just possible that the blowing about of both horse and cattle manure may have something to do with the moulds grown on beef (chilled), which was a considerable source of trouble at one time. Section A, Article 17, of the regulations relating to Cold Stores, etc. (Appendix 3) provides for paving.

The walls of the buildings are generally of brick, but in some cases galvanised iron is used. In height some are on two, others on three, and some on four floor principles.

The floors are composed of various materials. In some cases wood is used ; this is very objectionable, as it is impossible to keep them thoroughly clean owing to their being pervious. In one place the wood floors were being replaced by impervious material. Section A, Article 3, of the Regulations (Appendix 3) states all floors must be of impervious material.

Ventilation : Drainage. Generally, the ventilation is fairly good, although in some cases the height from one floor to another was too low. The effluvium arising from drying of sinews, bones, etc., should be conveyed through pipes and discharged under the furnace bars of the boilers, as in the system enforced in all offensive trades in London. This I did not see adopted in any of the Frigorificos.

The drainage appeared to be fairly good. In some places the sewage was discharged into the adjoining river without any treatment, in other places filter beds were used, and in one place the whole of the sewage was forced through pipes on to the land, where the fluid soaked into the soil, and the solids, left on the surface, dried quickly in the sun, and were subsequently collected as material for brick making.

Water Supply. All water, according to the Orders of the Direccion General de Ganaderia, must be from public supply or deep wells, and samples are taken from time to time by the veterinary surgeons in charge of meat inspection for the purposes of analyis. *Vide* Section B, Article 23 (8), Appendix 3.

Lavatory accommodation is provided for all employees and kept clean by the owners of the premises.

Cleanliness of the Premises. Generally, this is good, and compares favourably with European abattoirs. All offal and bye-products are dealt with when fresh, at least within 24 hours from the time of slaughter, and therefore there exists little effluvium, except from the drying of sinews, bones, etc., above mentioned.

Health of the Employees. Under the regulations applying to Frigorificos (*vide* Article 27 (A), Appendix 3), it is necessary that employees at once notify any case of infectious disease in their families, and no person residing in a house where infectious disease exists is allowed to continue at work.

The cleanliness of the employees varied in the different establishments ; it must be recognised that it is difficult even in this country to enforce perfect cleanliness of abattoir employees, and it is much more difficult with regard to the class of some of the people in these Frigorificos. According to Article 27 (C), Appendix 3, overalls should be provided for all employees ; in some establishments two white overalls per person were provided for all employees handling meat in the course of preparation. These employees were required to have a clean overall at the beginning of each week and another at the middle of the week, the employees having to wash and keep clean the overalls. With the exception of the people employed in the canning departments these regulations did not seem to be carried out as they ought to be. Where the overalls are provided, the managers state they refuse to allow any person to begin work if he did not comply with this regulation. From observations it would appear that the Regulation was not strictly enforced, but it is certainly a good one, and should be enforced in all Frigorificos.

Tables, etc. The tables on which offal, etc., were handled were in many cases made of wood with no impervious covering ; those should be covered with a suitable material such as zinc, and all trolleys constructed in a similar manner. According to Article 7 (C), and Article 9 (B), of the Regulations, Appendix 3, it is compulsory for the owners of the Frigorificos to do this, but it certainly was not carried out in every case.

Plan of the Frigorificos.

In general the Frigorificos consist of the following places, namely :—

1. General office, including office of veterinary and meat inspectors. 2. Hungering shed for cattle. 3. Spray bath. 4. Bleeding room. 5. Slaughter halls for cattle and sheep. 6. Freezing and chilling room. 7. Oleo room. 8. Canning room. 9. Sausage room (not in all cases). 10. Detention room. 11. Laboratory (veterinary inspectors and chemical) and departments for : 12. Digesters. 13. Driers. 14. Hide curing. 15. Fell-mongering. 16. Bone and sinew drying. 17. Gut cleaning. 18. Tripe cleaning. 19. Blood steaming and drying. 20. Hoof and horn. 21. Bone crushing. 22. Neats foot, oil extracting. 23. Tallow melting, and in some cases—24. Glue making. 25. Soap making. 26. Glycerine extraction.

In addition they all have :—Boiler sheds, engine rooms, electric light generating station, carpenters' shops, blacksmith shop, general mechanic shop and general stores.

The general arrangement of the buildings in some instances is not good. When the plans were drawn the question of economy in labour seems to have been the chief feature, and sanitary principles second, as hide curing, bone, hoof, horn and sinew drying, digesters, dryers, and bone grinding, were observed practically under the same roof as where slaughtering and the preparation of the meat for food is carried on. In other places attention had been given to this matter. It is an acknowledged principle from a sanitary point of view that all trades known as "offensive trades" in this country, should, when plans for abattoirs are being drawn up, be kept some distance from the premises where the animals are killed, and the carcases dressed for human consumption, also away from any canning department, offal department, or hanging room. Thus the premises numbered from 12 to 26 should all be kept separate from the slaughtering-places and where meat extract, etc., is prepared for human food.

The freezing and chilling rooms at the Frigorificos are similar in many respects to those in this country, and were satisfactorily clean. In some of them the "Linley Process" is used, and the managers report good results from it.

Loading of Meat into Steamers. In some places the loading of the meat into steamers is done direct, that is to say, the ocean steamers arrive alongside the Frigorificos. To avoid rain or dirt falling on the meat a covered run is used—*i.e.*, rails extend from the freezing-rooms to the ship's side, on which trolleys conveying the meat are run, or overhead rails are used, on which the quarters of beef are conveyed on hooks and rollers. In one place a temporary canvas cover is used if rain is falling, and in another place the manager stated it was proposed to erect a permanent overhead covering to protect the meat while being loaded. Some of the Frigorificos are situated where the ocean steamers cannot get alongside, and at such places small vessels called "Transporters" are used ; these have insulated compartments, and were found on inspection quite clean and satisfactory.

It is to the interest of the owners of the meat that it be conveyed in as perfect a condition as possible, and the price realised in Smithfield fully recompenses them for the expense and care in handling at the Frigorificos. There exists a healthy competition amongst the various firms as to the condition of the meat when it arrives at Smithfield.

Ocean Steamers. Several of these were visited at unexpected times, the holds were carefully examined prior to loading, also while the meat was being loaded, and nothing objectionable was observed. It was ascer-

tained that the holds are carefully examined by surveyors for the Underwriters prior to the meat being loaded. In some other cases engineers on behalf of the owners of the meat also examine the holds in order to ensure that everything is right, and to avoid disputes with the underwriter's surveyors when the meat arrives in London. In addition a responsible officer is always sent by the owners of the meat to take charge of the men while loading is going on, and to check any undesirable practices which at one time were said to be common.

The temperature of the hold containing the meat is taken regularly during transit from South America to the Port of landing, and a register carefully kept.

In connection with many of the steamers the "Linley Process" is used for chilled meat. Whether it be due to this process or not, it is a fact that moulds on chilled beef in Smithfield market is now a rare occurrence, while a few years ago it was a common occurrence. By this process the cloths, before being put on the meat, are treated, the barges (transporters) are periodically treated, the ship's holds are treated before the meat is loaded into them, then when the hatches are put on, the meat is given another charge of formaldehyde vapour to neutralise any contamination due to handling, etc.

Under Lindley's No. 2 system the atmosphere of the holds is cleansed *en route* as follows:—Two tanks are used, one containing sticks of chloride of calcium, the other containing sulphuric acid in which discs of lead revolve, the air from the holds which contain the meat is passed over these tanks, and thereby dried and purified before being returned, care being taken only to work the apparatus about half an hour each day, so as not to remove too much moisture from the air. Care is taken to use as little formaldehyde as possible consistent with obtaining the desired result, and in order to comply with the requirements of the Local Government Board.

Slaughter.

Animals are purchased in the markets or on estancios and thence conveyed by rail or steamer to the "corrales" or "camps." Some Frigorificos have very large camps extending over 6000 acres. There the animals rest and feed on grass for some time, depending on the demand of the British markets; from there they are brought to the "corrales" where there is accommodation for 3000 to 5000 animals, here they are fed, watered and rested for 48 hours, and then watered only for 24 hours in what is called the "hungering place." Prior to slaughter they are removed in numbers and put under a spray bath for some time, where jets of water fall on and around them; this is said to cool and quieten the animals and also to loosen the dirt on the skin.

In one place they are put through a swimming bath: I was assured that this did good, and no doubt those responsible must be qualified to judge the benefits derived, but other persons viewing the following procedure may have a different opinion. Here the animals are driven up a few steps and then down a few steps into a bath through which they swim, but there is a considerable amount of struggling and crushing when two animals enter the passage which leads to the bath. The method of driving the animals on is by means of an electric pole which conveys a slight shock to the animals. This has been found a much more humane method than using sticks, etc.

One animal follows another into the bath, swims through the dirty water in which scores of its companions have previously gone, then struggles up a few slippery steps into what is called the "knocking box," the door behind is closed, thus it cannot move in any direction as the boxes are about the size of a large ox. A man standing on a platform nearly level with the back of the animal, hits it on the front of the head, or if the head is turned down, the blow is aimed at the back of the head. The hammer used has a flat face, somewhat like a blacksmith's forge hammer, for the reason that a pole-axe would injure the brain, which has a commercial value. The animal falls from the the effect of the blow, a lever is pressed, one side of the box rises, also the floor from one side, so that the animal is pitched out on to a floor where a boy stands ready with a chain, part of which he puts round the animal's hind legs just above the hock joint, the other part he attaches to a hoist which quickly raises the dead animal to a sufficient height to allow the weight of the body to run it by gravitation by means of a hook and rollers; or in some places an electric travelling crane conveys the dead animals at the rate of one per minute to the place where the animals are bled. There a man stands with a large knife and opens the large blood vessels at the entrance to the chest. After the blood has ceased to run out of the carcase, it is pushed along as described to the "header," who skins the head and disjoints it from the neck, but allows it to remain attached by means of the skin. The carcase is now quickly removed to the dressing hall, the man in charge of it looks for a place on the floor where the slaughtermen have finished skinning a carcase and there deposits it.

Dressing and Skinning the Carcase.

The slaughtermen or dressers at once begin to remove the skin from the carcase, with the exception of the part which is next the floor, that is down the centre of the back. The sternum is sawn through, as also the pelvis, the abdomen is opened, the omentum removed, and the carcase is again pulled up by an electric hoist: as it is being hoisted the head is removed and the internal organs pulled out on to the floor and the skin removed from the back. Two men with a double-handled or cross-cut saw then divide the vertebræ, and the carcase now hangs in two "sides" of beef.

If the carcase is found free from disease by the inspector, it is pushed away to make room for another. If it is found diseased it may be at once sent with all the organs for destruction, or it may be sent to the detention room for further examination.

Two men now begin to wash, trim and clean the sides of beef; the method of trimming and finishing is somewhat similar to that in this country, but the method of washing is far superior. In some of the abattoirs in England an old wooden tub is used to hold the washing water. This water is often not changed during the whole day's work, but has fresh water added to it when required. The cloths or swabs being pieces of old meat wraps, by means of which the sides of beef are washed down: invariably these cloths are never properly scalded or kept as clean as they ought to be, and in some cases are used from day to day until worn out and discarded and then replaced by another of similar material.

In the Frigorificos a tank is fixed above the dressing place. In this, water is kept at a suitable temperature and conveyed by means of an indiarubber pipe in such a way that it can be attached to the middle of a brush made of fibre through a hole in the back of it and thus a steady stream of clean fresh water continually flows through the brush so that the same water is never used twice, and the brush is scalded at the end of each day's work. I examined these brushes and found them quite free from any objectionable matter, and they bore evidence that the statement as to scalding daily, was carried out.

The sides of beef are now sent by rail towards the entrance of the refrigerators, where they are allowed

to hang until a number have accumulated, sometimes about an hour's duration. They are then classified, those intended to be frozen are put into the chambers at a temperature of 10 degrees Fahrenheit, those intended to be chilled into a temperature of 29 degrees Fahrenheit, where they are kept until ready for shipment, the time depending upon the demand of the British markets. Prior to being shipped they are stamped, weighed, graded, labelled, and put on board the transporters or ocean steamers.

Sheep.

Sheep are slaughtered in the same manner as in this country, that is by placing them on a crutch, a knife is passed quickly through the neck, the main blood vessels are severed, also the spinal cord. The carcases are dressed in a similar manner in all large factories, namely, on a hook and not on the floor as in the London method. After being skinned the carcases, if sound, are thoroughly cleaned. In some places they are put on a travelling rail, on which they are graded, then weighed, stamped, labelled, and passed into the refrigerators at a temperature of about 10 degrees Fahrenheit.

Offal, or By-products.

It is here that the great difference exists between the old methods existing in this country and the modern methods of the Frigorifico owners in operation in South America.

Blood. As all the animals are bled at one place, the blood enters into a tank from which it is forced through pipes to the compartment where it is steamed, pressed, and ultimately dried for use as blood manure. In some Frigorificos great care is taken to obtain the blood as pure as possible, and the finished product showed 17½ per cent. of ammonia.

Hides. These are fleshed (that is, any pieces of the subcutaneous tissue left on the hide are cut off) in some places by machinery, in other places by hand, the hide is then washed, scrubbed and sprayed, next put into a wet pickle for some hours, then taken out, classified, put into packs, with dry salt between each hide and kept for about three weeks. They are sold to the highest bidder irrespective of what country he comes from.

The hair from the end of the ox tails is washed, dried and exported, being used for furniture stuffing, etc.

Feet are disposed of in a variety of ways, the leg bones from them are washed, boiled, dried and sent away to make knife handles, etc., the tendons are dried and sent away to make glue. The hoofs are dealt with in a similar manner. From the internal portion of the foot, Neat's foot oil is extracted.

The horns are dried, boiled down, ground and used for fertilizer. The piths from the horns are dried and sent away to make glue.

The flesh from the sides of the head (termed head meat) is washed, cleaned, frozen, and exported. The skull is split down by means of patent machinery or by hand labour, the brain being left undamaged. The bones are ground down, digested, and used for fertilizer.

Brains are taken carefully from the head, washed, cleaned, frozen, and exported or sold locally.

The tongues are washed, trimmed, put into moulds to give them the proper shape, frozen, then put into boxes or bags and exported.

The thymus or sweetbread is washed, trimmed, frozen, and exported, and in some cases sold locally.

All the lungs are put into the digester, the majority being affected with parasitic disease.

The hearts are washed, frozen, put into boxes and exported, in some cases they are cut up and used for meat extract.

Only a small percentage of the livers are found free from disease (parasitic), those passed as fit for human food are washed, frozen, and exported. Those found diseased are put into the digester for fertilizer.

The pillars of the diaphragm (termed by the trade "thick skirts") are trimmed, frozen, packed, and exported.

The muscular portion of the œsophagus is frozen and exported. The connective tissue portion is cleaned, dried, blown up, tied at each end and sold as "weasands," and used for sausage casings.

In some places the thyroid glands are dried, dessicated and exported.

In some places the supra-renal bodies are preserved and exported.

In some of the Frigorificos, after the gall is collected, a little antiseptic is added, it is then placed into barrels and exported.

The skulls and bones cut from the carcases, etc., are put through a bone crushing machine, then into the digester, and used for fertilizer.

Portions of the stomachs are washed, scalded, scraped, frozen, and exported.

The spleens are all put into tankage (digester),

The fat of the omentum and mesentery, if free from disease, is converted into oleo; if diseased it is put into the digester.

The intestines are carefully washed, inverted, scraped and carefully examined, any diseased parts cut out, then salted, packed, and exported. The diseased parts are sent away to the digesters. From a certain portion of the intestines gold beaters' skin is taken and preserved.

If the kidneys are not left in the carcase they are cleaned, frozen, packed, and exported.

Tails are cleaned, frozen, and exported.

All trimmings are carefully collected, and sent to the digesters.

Bladders are cleaned, blown, dried, and exported.

The generative organs are all carefully collected, and sent to the digesters.

All the floor sweepings and small places of fat are carefully collected, and sent to the digesters.

Sheep Offal.

The blood is disposed of in the same manner as from the oxen.

In some cases the heads were put into the digesters without the flesh from the cheeks being previously removed. In other cases the flesh was sent to the canning department.

The tongues were cut out, salted, boiled, and canned,

The lungs, as in the case of the oxen, were generally found affected with parasitic disease, and all sent to the digester.

Hearts are washed, frozen, packed, and exported, and in some cases they are converted into extract.

Thyroid glands, supra-renal bodies, and intestines are treated in the same manner as in oxen.

In the majority of cases the livers are found affected with parasitic disease and sent to the digester. The stomachs are all sent to the digester, so too are bladders and generative organs, and feet.

Kidneys are cooled, packed, frozen, and exported.

The fat from the carcases which are found fit for human food is sent to the oleo department, but from those found affected with disease it is put into the digester.

Sheep Skins.

The sheep skins are sent to the fell-mongering department, where they are soaked and washed, all clots taken off, then dried, painted with a solution, and the wool pulled off. The wool is put through a drying machine, then packed into bales by means of an

hydraulic press and exported. The pelts are washed and put through a series of processes, packed into barrels and sent to the United States.

As showing the care that is taken of all bye-products and that everything is used that can be converted into money, in some places even the contents of the stomachs are pressed and used as fuel in the furnaces, and the water collected from the floors, etc., passes through catch pans, from which the fat is skimmed off and returned to the digesters.

At the two Frigorificos in Uruguay, which are managed by Messrs. Sansinena Co. and Messrs. The Swift Beef Co., the plans of the premises and the whole method of doing business is very much on the same lines as in the Argentine factories.

(To be concluded).

DISEASES OF ANIMALS ACTS 1894 TO 1911, SUMMARY OF RETURNS.

Period.		Anthrax		Foot-and-Mouth Disease.		Glanders.†		Parasitic Mange.		Sheep Scab.	Swine Fever.	
		Out-breaks (a)	Animals.	Out-breaks (a	Animals.	Out-breaks (b)	Animals.	Out-breaks (b)	Animals.	(b)	Out-breaks (a)	Slaughtered. *
IRELAND. Week ended Aug. 8		...	...	...	...	...	...	Outbreaks 1		4	2	8
Corresponding Week in	1913 ...	...	...	...	...	...	...	1		1	5	19
	1912 ...	...	...	...	3	...	...	1		...	6	15
	1911 ...	1	5	...	...	...	...	...		4	3	18
Total for 32 weeks, 1914 ...		1	1	76	955	...	...	56		379	144	717
Corresponding period in	1913 ...	...	...	...	...	...	...	94		353	103	608
	1912 ...	3	3	16	203	...	...	50		262	167	1436
	1911 ...	7	12	...	...	2	3	45		250	84	1477

Department of Agriculture and Technical Instruction for Ireland, (Veterinary Branch), Dublin, Aug. 10, 1914

NOTE.—The figures for the Current Year are approximate only. * As Diseased or Exposed to Infection

THE GLASGOW VETERINARY COLLEGE (INCORPORATED).

The Governors have pleasure in submitting their Fifth Annual Report of the College since its incorporation.

For the first time since the incorporation of the College, the accounts show a surplus and a satisfactory financial state of affairs. The Governors were successful in obtaining grants from the Board of Agriculture, which had the effect of liquidating the deficiency of £641 2s. 9d. as at 15th May, 1912, and the additional deficiency of £106 17s. 6d. at 15th May, 1913.

It should be clearly noticed, however, that the balance of £105 1s. 5½d. brought out in the Revenue Account is almost wholly accounted for by the *shorter financial period*, and by taking the contributions from the City and County Councils at their full amounts, while the expenditure is on a periodical proportionate basis. A year or two may elapse before the accounts finally adjust themselves after the various changes.

In connection with the alteration scheme, the Governors have been successful in receiving further promises of grants, which now total £2,873 10s. This amount covers the estimated cost of the alterations, which, are now completed, but all the accounts for which have not yet been certified by the treasurer.

Regarding the proposed investigation into the causes of Braxy, the Governors regret that notwithstanding the exercise of considerable pressure, the Development Commissioners have not yet given their decision on the application for a grant to this College. The Association of Veterinary Officers of Health applied to the Governors to provide facilities for the examination of samples of milk, and the Governors arranged with Dr. M'Crorie, bacteriologist of the Royal Infirmary, to conduct the desired examinations until the bacteriologist is appointed by this College. The Governors of the Infirmary kindly consented to the arrangement.

(Signed) ALEXR. RUSSELL, Sec.

105 St. Vincent Street, Glasgow.

ABSTRACT OF REPORT ON THE WORK OF SESSION 1912-13 AND PART OF SESSION 1913-14.

On 19th July, 1913, 33 of the Glasgow students were examined; 23 were passed and 10 rejected, giving a total pass of 70 per cent., which I consider highly satisfactory when taken in conjunction with the fact that the student requires to take three subjects at each examination, and that failure in one subject alone carries rejection in all three, and that the conjoined or aggregate pass at all the Veterinary Colleges did not exceed 64·2 per cent.

In the session 1913-14, there have been 44 veterinary students in daily attendance studying for the Diploma of the Royal College of Veterinary Surgeons.

There have also been 56 students from the West of Scotland Agricultural College receiving instruction in veterinary hygiene, dietetics, and the breeding and management of farm stock in health, diseases, etc.

There has been an increase in the number of "A," or first year's students, as compared with the past seven sessions; and an increase of fees, amounting to £144 18s. for the present session, as compared with Session 1912-13 and of £235, as compared with session 1911-12.

The attendance and conduct of the students have been regular and exemplary, and the relations existing between the teachers and students continue to be of a friendly, deferential, and appreciative character.

It will, I have no doubt, interest the Governors of the College to know that the graduates of this College are all actively engaged in private practice or in the employment of Government or Municipal Authorities, and that the demand for their services is greater than can be met.

JAMES MCCALL, F.R.C.V.S., Principal.

May 31, 1914.

The balance sheet is now brought to March 31st instead of to May 15, as heretofore. The capital account shows expenditure to March on buildings and equipment £11802 13s. 6d.; other assets, including unexpired insurance, £378 1s. 2d., with cash balances £646 2s. 5½d.

The cash account is stated in the report to cover May 16th, 1913, to March 31st, 1914, but this is not shown in the account. Income includes Town and C.C. grants from Corporation of Glasgow, Lanarkshire, Ayrshire, Renfrewshire, Dumbartonshire Argylshire, £368 15s. Board of Agriculture, Scotland, £350; Fees of students £431 18s. Expenditure shows salaries £640 4s.; Rates, taxes, and insurance £118 15s. 8d.; Income tax £8 5s. 10d.; N.H. insurance £1 12s. 4d.; Supplies and apparatus £16 7s. 7d.; Special lectures £10 9s. 9d (against this item income shows fees £4); General expenses £133 5s. 11½d.; Sundry items (including coal, gas, water, stationery) giving a total £1269 4s. 7½d. which includes £105 1s. 5½d. balance to capital account. The net revenue account shows Government grants for deficiency, 1910, 11, 12, 13 (presumably to May 15th) £748 0s. 3d.

The auditors' certificate explains that "the full amount of "grants" and "subscriptions" received has been carried to the credit of revenue (cash) account to March 31st, while the College session does not terminate until July. 1914."

THE ADRENAL GLANDS.

By T. R. Elliott, M.D., F.R.S. Assistant Physician at University College Hospital.

Abstract from the Sidney Ringer Memorial Lecture delivered at University College Hospital Medical School, June, 1914.

Much of Ringer's strength, like that of Oliver Cromwell, was due to his faith. He believed in the healing powers of his art with a sincerity and vigour that fail to inspire the outlook of physicians in these later days. Hence came the need for the utmost nicety of diagnostic skill—and all of his generation bear witness to the singular refinements of his powers of clinical reasoning Hence, too, his unresting endeavours to win certain knowledge of the action of therapeutic drugs, by observations on man, and by experiments on animals. Medicine to him was not an affair of pathological diagnosis to be followed by a word of encouragement to the sufferer and by a demonstration to the onlookers. Life, he thought, might be aided in its struggle against the ravages of disease, if happy chance or reasoned wisdom could but find the therapeutic means. Along both paths Ringer sought to achieve this end. On the first every lead was tried the slenderest fancy was tested; but his sure judgment instantly turned back when the hoped for help proved but a wandering marsh-light. For this scientific workers have termed him an empiricist, justly, and yet with no reproach. The empiricist of the hospital wards was the Euclid of the pharmacological laboratory. Slowly and surely he reasoned out the elementary propositions of the action of simple salts on living cells, and Ringer's solution is applied by modern analysts to these problems in more than the simply material sense.

For twenty years such questions attracted Ringer, in his few hours of leisure, to the laboratories of University College, and there it chanced one afternoon in 1893, almost at the close of this long period of devotion to research, that he saw the first experiment that gave to physiology her main ideas upon the function of the adrenal glands.

The story of this discovery has already been told by Sir Edward Schäfer. A former student of our hospital, Dr. George Oliver, had devised apparatus to measure the calibre of the peripheral arteries in man, and he had observed that when drachm doses of a glycerine extract of the adrenal glands were given by the mouth to his son they made him sick, and his radial artery became constricted. A superficial thinker would have passed this by, and satisfied himself with an explanation on the accepted lines of knowledge from the toxic action which the extract of the glands was already known to possess. Oliver would not do so. Half an explanation is often worse than none, for it may lead to a contented neglect of the new truth that lies hidden beyond. He sought the test of a laboratory experiment. With a little demur at the waste of time in humouring the fancies of a clinician, Schäfer consented to inject some of the extract into a cat, and he and Ringer, with Oliver, then saw that abrupt and amazing rise of blood pressure which occurs as the heart and arteries are stimulated to intense constriction by the active principle. Ringer seems to have taken no deep interest in the matter. Schäfer and Oliver analysed the chief reactions produced in the body by these injections, and subsequent work in the intervening twenty years has discovered what these reactions mean. Physiology is now possessed of half of the secret of these glands.

The distribution of the efferent nerves, which the central nervous system supplies to the viscera and blood vessels of our bodies, was first clearly described by Dr. W. H. Gaskell, who was once a student with Ringer at our hospital. Following up his brilliant generalisations the English school of physiologists has analysed in great detail the intricate network of these nerves, and Prof. Langley's account of the autonomic nervous system is now accepted the wide world over. These nerves to plain or unstriped muscle issue from the central nervous system in three main groups—the vagal, the sympathetic and the pelvic, which histologically cannot be distinguished from one another, The test of adrenalin laid bare a fundamental difference. Adrenalin was found to stimulate all plain muscle or gland cells that were united with the nerves arising in the thoracico-lumbar tract of the spinal cord between the roots of supply to the fore and hind limbs of the body. From no other contractile tissue did it call forth any response. And the reaction of the muscle or gland cell, when excited by this substance, was of precisely the same character as that which it showed in response to excitation of the visceral nerve supplying it. The wall of the stomach was inhibited, its pyloric sphincter contracted by adrenalin precisely as by the stimulation of the splanchnic nerves. So, too, with the bowel and its ileo-colic sphincter, with the body of the bladder (in the cat) and its sphincter. From this peculiar reaction it became evident that the thoracico-lumbar set of visceral nerves belong to an entirely different group from the vagal and the pelvic. They form the so-called sympathetic set, an order that in its present function and equally in its past developmental history differs profoundly from the rest.

Next arose the question as to why and how this glandular extract is so intimately related to the activities of a special part of the nervous system.

The adrenal gland is a two-fold structure. Its centre is composed of masses of delicate semi-fluid cells, which are richly supplied with sympathetic nerves, and lie enmeshed among thin-walled veins. These contain adrenalin. Intermingled here and there with them, and growing out over the surface of the adrenalin cells so as to form a complete envelope to the medulla, are the cells of the cortex. Their innervation is scanty: they yield no adrenalin or known active principle to extraction, but they are generally laden with a rich store of a peculiar fatty substance.

It will be convenient to review separately what is at present known with regard to the function of each of these masses of glandular cells.

In the first place it has been proved beyond all doubt that the medullary cells excrete adrenalin directly into the venous blood stream, and that they do this in part

automatically, but chiefly in response to a call made through nervous impulses descending by the splanchnic nerves. The experiments of Dreyer and of Tscheboksaroff first showed this, and fuller methods of analysis in the last two years have demonstrated the fact completely. I may quote the following experiment which reveals neatly what occurs in the body. The superior cervical ganglion was excised from a cat's neck. This causes the pupil on that side to become smaller from paralysis of the sympathetic nerve, but the iris in a few days acquires an enhanced sensitiveness to adrenalin so that it dilates much more readily than the muscle of the contralateral pupil when small quantities of adrenalin are injected into the circulation. A week later the right and left splanchnic nerves were each divided and prepared for electrical stimulation. On one side the adrenal gland was excised. Stimulation of the splanchnic nerve on the side where the gland remained had then this result. The blood pressure rose in the usual steep curve for 8 or 10 seconds. Suddenly the rise was checked, and was replaced by a smoothly hollowed fall; at the very moment of this turn in the curve the denervated eye as suddenly reacted. Its prolapsed nictitating membrane flashed back, and the iris became dilated to the narrowest rim of yellow around the great black globe. The response of the eye and the secondary fall, not rise, of the blood pressure curve were due to adrenalin that had been excreted from the gland and, after the delay of passage through the lung vessels, had ultimately been distributed through the outflow from the aorta. Stimulation of the other splanchnic nerve, from which the adrenal gland had been removed, caused the blood pressure to rise to the same extent, but there was no secondary fall and no response at a distance in the eye.

I found in cats that in addition to the effect of this transitory stimulus it was easy to recognise a more prolonged excitation through the splanchnic nerves, which in a few hours would discharge the adrenalin until the cells were almost entirely exhausted. This was shown by cutting the nerves on one side, submitting the animal to conditions that were likely to induce exhaustion, and then measuring the amount of adrenalin left in each gland. Prolonged fright emptied the cells. So too did the vaso-motor irritation caused by laceration and hæmorrhage in the brain. The mere condition of anæsthesia induced by ether or chloroform for three or four hours led to a rapid exhaustion. But in every case the loss depended upon excitant nervous impulses, so that the load of adrenalin suffered no loss if the nerves were first divided.

From this it follows that the central nervous system has at its disposal two methods for excitation of the mass of plain muscle that is supplied by the sympathetic nerves. The first is that which had been known for a long time, by the directly applied stimulus of the nervous impulse, which can be accurately restricted to one particular spot and delicately adjusted in its strength. The second is that of which physiology has but recently become aware, by the discharge of adrenalin into the blood stream, whence this powerful stimulus diffuses into every quarter of the body so as to be capable of exciting in one great massed effect all the plain muscle of the sympathetic system.

Morphological workers have proved that these adrenalin cells are related by a common parentage to the ganglion cells of the sympathetic nerves, and I have shown by observations on the result of degenerative section of their nerves that they probably receive their innervation directly from preganglionic fibres. All the secreting glands of which the innervation is known are connected to the spinal cord by nerves of the ordinary visceral type—that is, with the interposition of a ganglion cell on the outward path. Here there does not appear to be such a relay, for the adrenalin cell is not of the peripheral tissue type. It ranks in the higher level of the ganglion cells, lies closer to the spinal cord, and is itself almost a member of the nervous hierarchy. The ganglion cell and the adrenalin cell are as brother and sister to one another, born from the same stock, living for the same end in life, which the one attains by growing out into direct contact with the moving mass of muscle, while the other stays quietly where it was born and exercises its influence from a distance.

Of all the diverse muscles united with the sympathetic nerves the most important and the bulkiest are those of the heart and blood vessels. Vasomotor nerves probably form much the largest fraction of the sympathetic group, and the oldest. Gaskell, junior, has traced them down below the vertebrates, and shown how the nerves and the adrenalin cells appear side by side in the worms and have developed a definite circulatory system. Adrenalin cells are present wherever there are blood vessels, even though these be of a very rudimentary type, and, indeed, in some examples they seem to usurp entirely the prerogative of the sympathetic nerves, for the latter cannot be found. Morphology therefore tells the same tale as physiological analysis. The adrenalin cells and the sympathetic nerves belong to a common system, whose first duty is that of sustaining the activities of the circulatory muscles. As the animal develops its muscular efficiency, learns a hundred new functions, and with a constant body temperature becomes independent of its environment, the sympathetic system becomes more and more complex and is split up into manifold possibilities of delicate adjustment. All these are but refinements of means for the one great end—to enable the animal to move more swiftly, to catch the prey, and to fight. Fighting power rises with the rise of blood pressure, reserves of sugar to feed the muscles are hurried up from the liver on the call of the circulating adrenalin, the daily routine of digestion is checked by intestinal inhibition, and the various segments of the bowel are cut off from one another by the closure of the sphincters. Cannon has reiterated this view and, further, shown very neatly how the clotting of blood by adrenalin, which had been observed by myself and others, is a further elaboration to check leakage in any chance wound of the body during action.

By that curious antithesis of the emotions upon which Charles Darwin laid stress, the machinery employed to prepare for fight may, with the cowardice of civilization, be set as powerfully in motion only to express fright. And in this the adrenalin is equally or perhaps even more, exhausted.

But another question arises to seize our attention. Why two systems of control, and what is their relation to each other in the fully developed mammal? Removal of each separately will supply some facts upon which an answer may be attempted to these questions. Taking the nerves first, removal of the thoracico-lumbar extent of the spinal cord interferes with the control of the animal's circulation, but it can still maintain its life. I have removed from a cat the bulk of the peripheral sympathetic ganglia connected with the heart and blood vessels of the viscera. It lived and its blood pressure was tolerably high. Therefore the nerves adjust the pressure and control the direction of the circulation, but upon them does not rest the maintenance of that muscular tone which upholds the pulse of life.

The theory which I at first held to explain these facts was that the nervous stimulus consists in a liberation of adrenalin itself from the ending of the nerve on the muscle. We have seen how the ganglion cell and the adrenalin cell are both derived from what is almost a common cell with power to transmit a nervous impulse

or to excrete adrenalin. It is very conceivable that as the nervous cell developed its peculiar outgrowths for the purpose of transmitting and localising the nervous impulse, it might lose its power of producing adrenalin and come to depend altogether on what could be picked up from the circulating blood and stored in its nerve endings. Removal of the glands would cut off this source of supply, and paralysis of the nerves would result sooner or later in that territory where the nerves had been functionally most active and had consumed their stores.

It is always a pleasure, and therefore a temptation, to accept a theory which harmonises all the facts into a simple, close-fitting plan. But the evidence at present does not justify us in welcoming this simplification. The paralysis of the splanchnic nerves does not appear until the nerves have lost their tone; and the atonic muscles then fail to react to such stimuli as pituitary extract, which is supposed to affect plain muscle directly. Moreover, removal of the vasomotor nerves does not cause that fatal fall of blood pressure which inevitably succeeds to the removal of the glands. It is therefore unwise to go beyond the bare statement that removal of the cortex and medulla of the adrenal glands causes death because the tone of the circulatory muscles is entirely dependent on the secretion of their cells. That does not rob the relationship of its peculiar interest. Here is a group of nerves which lose their power when the energy of their system runs low. The energy is supplied from the secretion of a separate mass of quasi-glandular cells. Whether it is stored in muscle or nerve is a question of secondary interest.

A comparison has been made which illustrates this view to some extent. Music and the quick clear change from note to note cannot be called from a violin string that is slack. The string must be toned, raised to its proper pitch, for the fingers and bow to play upon it. The muscular tone of the blood vessels is given by the adrenal secretion, and the nervous impulse alters it this way or that in harmony with the body's needs.

Naturally one longs to find examples of a similar mechanism in other parts of the body, to apply this equation of interaction to the problems of nervous activity in the greater departments of the nervous system. The striped skeletal muscles form a homogenous group which is continually under a tonic influence. This tone is for the most part derived from direct nervous impulses, but the diseased state of myasthenia gravis proves that the tone is not altogether supplied from the central nervous system. Myasthenia might in the skeletal muscles correspond to the state of Addison's disease in the blood vessels. But this is only a surmise. I have tried in vain to discover an active substance in the muscle plates of striped muscle. And Prof. Herring was also disappointed when he examined for this purpose the electrical organs of the skate, which are exaggerated motor plates. The ganglia of other visceral nerves, the auriculo-ventricular bundle of His, the spinal cord itself—all have been extracted and nothing as yet found. But it is hard to forego the belief that such discoveries lie in the lap of the future. Nervous energy may need for its awakening something more material than the subtle interplay of impulses in nervous tissue. That wearisome ailment, neurasthenia, might be curable by some extractive of comparatively simple chemical nature, and those who suffer from it, together with those who must try to alleviate their woes, be both freed from a depressing bondage to uselessness.

From what I have tried to relate it will appear that physiology has a tolerably full knowledge of the nature of the medullary cells of the adrenal glands. Pathology merely confirms this. In many diseases the adrenalin load of the glands is diminished, but not often to what might be looked upon as a really serious state of depletion. The weight of a single normal gland in man is 4 grams, and its adrenalin load is 4 mg. This falls to 1 mg. in many fatal fevers. The greatest exhaustion that I have seen to occur rapidly was not in fevers but in cases in which, with acute cardiac failure and perfect consciousness of his dangerous state, the patient was, so to speak, fighting for life, struggling to keep up his heart. In those the adrenalin load was less than 0·5 mg. I could find no justification for the belief that the adrenalin cells are hypertrophied or more active in diseases associated with persistent increase of blood pressure.

Of the functions of the cortex more might be said than about the medulla, for the usual reason that little is known, and consequently every statement has to be guarded by reservations and contradictions. The cortex in the higher animals forms at least 90 per cent. of the bulk of the gland. Its cells in health are loaded with a doubly refractive fat composed of cholesterin esters and lecithin, and this lipoid is just as distinctive of the analogous cells which accompany the adrenalin cells even in animals below the veterbrates. Here, once more, we are dealing with an archaic tissue that has been preserved and, indeed, enlarged in higher animals for the sake of its peculiar properties.

The microscope shows that the chief activity of the cortical cells is directed towards the formation of this special fatty substance. It is particularly abundant in the glands of man, and some quite definite knowledge with regard to it has been accumulated by several pathologists who have studied the adrenals in death from various diseases.

In the first place, it is clear that the cortical lipoid bears no immediate relationship to the ordinary fats of the body. Inanition from cancer of the alimentary canal, or the beggarly emaciation of anorexia nervosa, strip all the fat from the body, and yet the cortex has its customary load.

On the other hand, the cortical fat vanishes in a couple of days' acute fever, by which the depots of body fat are hardly touched. All septic fevers reduce the cortical fat rapidly. The most obvious example of this is in acute pneumonia, where the gland becomes fatless, œdematous, and swollen to twice its natural size. Slow febrile processes, such as that of chronic tuberculosis, cause much less exhaustion. But the removal of the lipoid is not determined simply by a physical change in relation to the rise of temperature. In one case which I examined there had for four days been hyperpyrexia rising intermittently to 109 deg. The cause of the pyrexia was not septic; it was due to cerebellar disease, with internal hydrocephalus and direct derangement of the thermotaxic nervous centres. And in this the cortical lipoid was not very much exhausted. Moreover, in several examples of prolonged hæmorrhage in chronic gastric ulcer, which recurred with a fatal issue, the lipoid was exhausted, though there had been no fever.

It is certain that these changes in the fat load of the cortical cells do not follow those in the adrenalin load of the medulla. There is no parallelism between the two. The great exhaustion of adrenalin, which has been described in cases of acute cardiac failure with emotional distress, occurred in glands with a full load of cortical fat. Fevers in man reduce the fat to a greater degree than they do the adrenalin. In the experiments which I made to demonstrate the exhaustion of adrenalin in cats, I failed to produce any very manifest alteration in the lipoid. Such as did appear was not in any way influenced by section of the splanchnic nerves, so that it seemed to lie outside immediate nervous control; and, indeed, the cortical fat was seen to have an identical distribution in two glands, of which the one was full, while the other was empty of adrenalin.

These, then, are the chief causes of loss of the lipoid. Its increase is also manifest in some diseased states. Single large adenomata, masses of cortical cells that are packed with lipoid, may occur in any individual and irrespective of any particular illness. But in kidney disease of the arterio-sclerotic form, where the atheromatous change is widely spread through the vessels of the body, the cortex does tend to proliferate in numerous small adenomata, or even to show a general massive hypertrophy. The relation is not to all forms of kidney disease, for I have seen cases of pure interstitial toxic nephritis which were watched in their condition of high blood pressure for a year or more, until at the end they succumbed to a slow uræmia, and yet with these the adrenal glands were not in the least enlarged. In the arterio-sclerotic forms with atheroma, though the cortex may be nearly doubled in bulk, there is no evidence of any increase in the size of the medulla.

These pathological facts, therefore, make it reasonable to regard the cortex in respect of its fat-holding function as a tissue altogether apart from the medulla and the sympathetic nervous system. Some recent work done in St. Petersburg and by Prof. Chauffard's school in Paris has illuminated this possible point of view. The Russian pathologists fed rabbits with cholesterin until their blood was laden with excess and atheromatous changes appeared in the intima of the aorta. This was a genuine atheroma, a deposit from the superabundance of cholesterin in the blood, just like the arthritic deposits of sodium urate in the uricæmia of gout. It developed in a few weeks, and simultaneously the cortex of the animal's adrenals was found to be enlarged by an enormous increase in the store of lipoid. I have repeated these experiments and confirmed the results at any rate in respect of the increase of size of the adrenal cortex. In Paris routine determinations were made of the percentage of cholesterin in human blood. It was found to be low in acute fevers, and especially in pneumonia, precisely where I found exhaustion of the cortical lipoid. It was high in arterio-sclerosis and atheroma. The analysis published by Grigaut shows that these changes correspond directly with the amount of cholesterin contained in the adrenals. From this it follows that the fat load of the cortical cells varies directly with the percentage of cholesterin bodies circulating in the blood, and through them the cortex may be concerned in the general nutrition of the body by facilitating the use in metabolism of the ordinary or of the more specialised fats. This theory may be adapted to contain within its scope all the facts that are known about the cortical cells. But these facts are still so few and ill-defined, that they cannot very well be used for a critical consideration of the theory. It will suffice to name the remainder of them in this connection.

The cortical cells seem to be essential for the maintenance of life. If one gland is removed from a cat, compensatory hypertrophy takes place in the tissues that are left. When, six months later, the second gland is excised, it may be much hypertrophied. It that case the cat will die in a few days after its removal. The hypertrophy is chiefly of the cortex. But the gland may but slightly enlarged, and then the animal will live longer, for this means that the loss has stirred to growth the accessory masses which lie along the vein that connects the kidney with the testicles or ovary. These masses are almost entirely cortical, and in one of my cats, though their total bulk was only one-third of the weight of one gland, they enabled the animal to live for two months in fair health until it was deliberately killed. I have not examined the cholesterin content of the blood of cats when dying after the loss of the glands. Certainly they lose weight and body fat very quickly, but that loss can be attributed to their disinclination to take food. It is not a conspicuous feature of Addison's disease.

The cortical cells are also of importance in the development of man's body during its early periods of life, especially in respect of his brain and sexual attributes. Man is unequalled among the animals in the enormous growth of his cerebral hemispheres during fœtal life. Equally distinctive of the human fetus is a great ante-natal hypertrophy of the adrenal cortex. Deformed children are from time to time born without cerebral hemispheres, and in them the adrenals are invariably as small as in the brainless animals. One may suppose that the cortical cells help to supply the fatty bodies that are needed for the architecture of the brain.

As certain as this relationship of brain to gland, and still more mysterious, is that of gland to sex. Maleness appears early, and with exaggerated emphasis, in children where adrenals are the seat of proliferative tumours. A girl with such a tumour may even lose physiological features of her sex, and acquire the hairiness and muscular development of a man. So far as I am aware, no pathologist into whose hands such tumours have come has examined their cells for fatty secretion, and doubt remains as to whether this sexual precocity should be ascribed to the lipoid or to some other substance. It is most improbable that the fat should be concerned solely with the activation of the sex glands, when that fat is found to be exhausted with such rapidity in septic fevers. Yet, on the other hand, it may well be imagined that a fatty material, which is supposed to be of vital importance in general nutrition, might in virtue of this quality nourish the body to more rapid growth of its sexual attributes—much as the so-called "royal" food used by bees will determine the sexual development of their queen.

The adrenal cortex is derived from a tissue which was the closest neighbour of the sex glands in their old abdominal position. Tiny islets of this tissue lie scattered along the path from the kidney to the descended sex gland, and it is from these vestiges that the accessory glands develop in compensatory hypertrophy. They definitely belong to the adrenal gland group. Embodied in the sex gland itself, either as the interstitial cells of the testis or as the lutein cells of the ovary, are fat-holding cells very similar to those of the adrenal cortex. These also seem to belong to the same group, but placed as direct nurses of the generative cells. If that is their nature, then it must be granted that they have acquired functions somewhat different from those of the adrenal cortex. I have not seen any example of their hypertrophy after removal of the adrenals; nor, conversely, is the adrenal either larger or less in cats that have undergone castration or ovariotomy. Despite these slight difficulties, the morphological evidence is, to my mind, sufficiently weighty to determine the balance in favour of the view that the cortex primarily controls nutritive material in regard of growth and reproduction. Secondarily, and now perhaps in the chief degree, it has become associated with cells which are really modified from the special department of the nervous system that governs the circulation. It is not known in which way this association acts. Cortex may feed medulla with some necessary precursor of adrenalin, or provide some adjuvant vaso-constrictor substance, as Abel's recent observations suggest Or, on the other hand, it may be that the medullary cells are placed near to the cortical cells in order that they may directly stimulate the latter to the performance of their peculiar duties. All that is still uncertain, and all that will surely be determined by future work.

It is necessary to realise very clearly this deep morphological distinction between the cortex and the tiny medulla. Only the latter is of nervous origin, and directly concerned with the functions of a part of the nervous system. Physiology may discover within the nervous system some substance with properties like

those of adrenalin to reinforce and maintain the powers of other departments than the sympathetic. But there is not the faintest reason to believe that such substances are prepared in the other ductless glands; that the thyroid, for example, is specially concerned with the activities of the vagal set of nerves. These other ductless glands are not derived from the nervous system, as is the medulla of the adrenal. The thyroid, the adrenal cortex, and the glandular part of the pituitary body belong, as Gaskell has urged, to an old segmental series of glands which were once related to the genital and excretory apparatus of each segment, and still retain, though greatly modified in each successive gland, the fundamental property of influencing growth and reproduction. How the tissues are affected by the secretion of the thyroid is an enigma. But the fact is certain. For the adrenal cortex even so much as that cannot be said. There is only the conjecture that this fatty substance is essential to a man's strength and manhood. The aboriginal natives of Australia threw boomerangs in curves that long puzzled the wits of the mathematicians of Europe. Their practical instinct seems also to have taught them what the medicine men of civilised life are now slowly reasoning out. To the Australians or "black fellow doctors" the fat above the kidney was magic. If by incantations it could be removed from an enemy as he slept, the victim would surely lose his strength and die. We know as much, that there is no warm-blooded life without these glands. Since the first experiment that Ringer watched 20 years ago we have learnt how they sustain the pulse of life, and we look to the future with a great surmise of what will come from an extension of this knowledge. But the chief gift is long delayed. Adrenalin is a more convenient hæmostatic than the old-fashioned cobwebs. Apart from that, therapeutics have gained nothing from all this new knowledge, and Ringer's comparative indifference to its birth was a prognosis that, to our regret, has been justified so far as his lifetime extended.—*The British Medical Journal.*

DISEASES OF ANIMALS ACTS 1894 TO 1911, SUMMARY OF RETURNS.

Period.	Anthrax		Foot-and-Mouth Disease.		Glanders.†		Parasitic Mange.		Sheep Scab.	Swine Fever.	
	Out-breaks (a)	Animals.	Out-breaks (a	Animals.	Out-breaks (b)	Animals.	Out-breaks (b)	Animals.	(b)	Out-breaks (a)	Slaughtered.
GT. BRITAIN. Week ended Aug. 15	11	11					5	6	1	61	224
Corresponding week in 1913 ...	6	7			2	2	34	54	2	61	551
Corresponding week in 1912 ...	5	5	4	25	1	3	19	33		40	427
Corresponding week in 1911 ...	11	16			4	4				37	582
Total for 33 weeks, 1914	505	546	11	74	71	176	1529	2664	151	2711	28412
Corresponding period in 1913 ...	367	402			110	286	1880	3798	127	1634	21903
Corresponding period in 1912 ...	550	626	67	435	118	226	2317	5050	170	2154	27958
Corresponding period in 1911 ...	548	685	7	420	124	302			306	1696	19937

(a) Confirmed. (b) Reported by Local Authorities. † Counties affected, animals attacked:
Board of Agriculture and Fisheries, Aug. 18, 1914

Swine-pox in Young Pigs.

The existence of swine-pox was until recently considered doubtful. Chauveau, Gerlach, and R. Koch had, however, demonstrated that cow-pox can be artificially communicated to pigs, but under natural conditions the disease had hardly ever been observed. In 1906 Szauto proved that pigs, especially suckling ones, sometimes contract the disease, and that they communicate it to healthy animals by merely living with them. Since then, from year to year the number of observations has increased, and it appears that in many districts of Hungary the disease is fairly frequent, that it attacks some herds every year, and sometimes it causes considerable losses. According to the writer's observations, it is one of the most frequent diseases of sucking pigs. Generally it develops so insidiously that the owner is only aware of its presence when a proportion of the weaned pigs are arrested in their development or some of them die. When the herds are once infected it is very difficult, as with cow-pox, to free them again, even making use of repeated disinfections.

The disease is accompanied by severe itching, which leads to the production of an eczema. The course of the attack is generally mild, but sometimes serious losses occur, mostly through complication with intestinal catarrh or chronic catarrhal pneumonia. In one herd necrosis of the teats was observed, but it is not certain that this complication was caused directly by the disease. Protective inoculations with cow-pox lymph gave good results in several localities on about 400 young pigs. Small nodosities were formed at the place of inoculation, but otherwise the animals' health was in no wise impaired. In one case, a few pigs developed small pustules on the inner side of the thigh, where they had been inoculated, and after six or eight weeks all the other animals fell ill, but not seriously. It is not impossible that these inoculations, which of late have been more frequently practised, may have contributed to the spread of the disease.—*Monthly Bulletin of the International Institute of Agriculture.*

New President of the Board of Agriculture.

The position of President of the Board of Agriculture and Fisheries which was rendered vacant by the appointment of Mr. Runciman as President of the Board of Trade, has been filled by Lord Lucas. Lord Lucas was previously engaged as Parliamentary Secretary to the Board in the House of Lords, a position which he filled with general acceptance. At Wrest Park, Ampthill, the new President has a famous herd of pedigree dairy shorthorns, and owns the cow Primrose Gift, the well-known champion dairy shorthorn at Shrewsbury Royal Show.

Lord Lucas was Under-Secretary at the War Office when Mr. Haldane acted as Secretary of State for War, and in that position he ably represented the Army in the House of Lords. His Lordship has a gift of handling details, and an admirable way of stating his case clearly and forcibly.

The Life History of the Scab Parasite.

As far as we know the life history of the common sheep scab parasite *Psoroptes communis* var. *ovis* has up till now never been investigated in South Africa, and all our knowledge concerning it was taken over from the standard European and American literature on the subject. According to these authorities fourteen to sixteen days are required for the evolution from egg to adult or even longer—fourteen to twenty-one days. It was thought necessary to undertake investigations to find out whether the life history of the parasite as hitherto conceived is correct as far as South African conditions are concerned. Mr. Shilston, Veterinary Research Officer, in charge of the laboratory at Pietermaritzburg, was entrusted with these investigations in the first instance, and the results obtained were controlled in a second lot of experiments at Onderstepoort under the care of Mr. Bedford, the Entomologist of the Veterinary Research Division. According to the results of these investigations, it appears that since most of the dipping fluids employed in the treatment of scab failed to destroy the vitality of eggs, it is necessary to regulate the interval between two successive periods, so that the second immersion is given before acari hatched from eggs that survived the first dipping begin to lay eggs themselves. It would appear evident that the second dipping should be given on the eighth day after the first, if we base the deduction on the Pietermaritzburg observations, and not later than the ninth day according to Onderstepoort results. The former probably indicates the shortest possible period, and a dipping on the eight day will reach those acari which would lay their eggs as late as the tenth day. The eggs all hatch within eight days, whether in direct contact with the skin or detached from it in the wool. Considering that the dipping fluid remains active in the skin for one or two days, the period might be extended to nine or ten days, but certainly not later. This requires, however, more experimental investigations.—*The Agricultural Journal* (Union of South Africa.)

Public Health Service in U.S.A.

The following is taken from a notice on Practical Sanitation. By F. Gardner, M.D., Captain Medical Corps, Indiana National Guard, etc., and J. P. Simonds, B.A., M.D., Professor of Preventive Medicine, and Bacteriology, University of Texas, in *The British Medical Journal*.

"The four essentials for an efficient public service are in the opinion of the authors: adequate training of the officials; full time duty: a proper remuneration for the work that is full of responsibility and sometimes dangerous, and a tenure of office dependent only on the proper discharge of duties. With respect to the last it is pointed out that it should not be possible to remove a sanitarian because he has made some politician put his filthy tenements or his dirty dairy into proper condition. Removals should be possible only upon charges properly brought before a Civil Service Board or a court. It appears that in the State of Indiana there is a single health officer or health commissioner who may seek advice within or without the ranks of the profession or of his State Board, but within his delegated powers he is supreme and only liable for an unreasonable use of his office. Experience has shown that this system has worked well, for within his area he has co-ordinate authority with the State Board of Health, and an order from him is just as binding for the condemnation of an insanitary schoolhouse or the settlement of a moot point in sanitation. The chapter on milk contains an account of the rules regulating the sanitation of dairies and the sale of milk in Indiana; these were first adopted by the Indiana State Dairy Association, and represent only the standard which practical dairymen are willing should be required. Many of the rules are very similar to regulations made under the Dairies, Cowsheds, and Milkshops Order in this country, though the milkers are not required to cleanse their hands before milking nor are the udders or flanks of the cows required to be kept clean. Although the administrative methods described differ in some material respects from those in vogue elsewhere, there is evidence of a completeness of procedure which might very well be copied. For example, when discussing the question of the isolation of infectious diseases it is recommended that dogs, cats, birds, or other pets should not on any account be allowed to remain in an infected house, for it is pointed out that their hair, fur, or feathers make them excellent carriers of infection from house to house, and in the case of cats and dogs, mingling with others of their kind, make possible that infection may overspread a city in which every human being has complied with the law."

Action for Damages.

In the action by Mr. Lindsay, v.s., Dumfries, against Douglas Rogerson, Chapmanleys, whom he sued for £1 10s. 6d. as the cost of repairing his trap after an accident near Lochfoot, Sheriff Napier has decided for defender, dismissing the action and finding Mr. Rogerson entitled to £2 6s. 9d. of expenses. The pursuer alleged that the horse was frightened by the noise caused by a servant and defender pumping water into a water cart at the side of the public road, but his lordheld that pursuer had failed to prove that there was any noise such as would frighten his horse.—*Dumfries and Galloway Standard.*

Corcyra and the St. Leger.

Mr. W. E. Livock, the Newmarket veterinary surgeon has been instructed by Lord Londonderry to issue the following facts concerning Corcyra:—

The horse has always had a varicose vein running across the tendon of the off foreleg, and several times last year it caused inconvenience during his training. Corcyra has never been lame, but lately there has been a slight filling and soreness of the leg. Under the circumstances I advised Captain Dewhurst not to continue the horse's preparation for the St. Leger.

As others see us.

A correspondent describing the Dublin Horse Show in *La Clinica Veterinara* speaks thus of the veterinary surgeons:—

"Our colleagues arrived at the show in their own motor cars and ranked with the judges and officials. Several had horses for sale or kept their own studs. They were rapid in their examinations, keen in observation, and correct in judgment. Naturally those engaged at the show were clinicians of great repute, who perhaps could not determine fine points relating to antigens or similar bodies *in vitro*, but possessing instead an invaluable gift of real clinical ability and keen judgment with culture and practical skill, well trained eyes and innate common sense."

The writer was also much struck with the custom of returning "luck money" with the accompanying ritual of spitting on it. He was also puzzled at first at the apparent low rank of the veterinary surgeons, hearing them spoken of generally as veterinary sergeants.

"Nothing Left to Chance."

The Winchester County Bench on Saturday were engaged in investigating a charge brought under the Official Secrets Act against three men named William Sidney Edwards, a steward, Joseph Edgar Stringer, a musician, and Richardo Ferrari, a Swiss, the charge being that they were persons suspected of being about to commit a felony by interrupting the telegraph service at Compton, on August 11th.

Lieut. H. J. Ashcroft Bradbury, veterinary officer attached to the Hants R.H.A., said that at 7.30 p.m. he was motoring along the Southampton Road towards Winchester, when he saw the three men. Stringer was standing at the base of a telegraph pole looking up at the wires, and the other two were on the opposite bank watching up and down the road. As he approached Stringer left the post and joined the others, but witness left them in charge of a boy scout and a military patrol which came up. In ordinary circumstances he would have taken the man for one of those who repaired the wires.—In reply to the Chairman, witness said he did not see the men do anything; it was a case of precaution, for nothing should be left to chance.—Replying to Stringer, witness said that the fact of his darting back to his companions aroused his suspicions.

Supt. Smith said he searched the men, but found on them nothing of an incriminating nature. Stringer explained to him that he and his companions were having a talk about telephone wires and wondering which was the Exchange wire. He stopped to look up, and because his eyesight was bad he held up a second pair of glasses, and no doubt that aroused the officer's suspicions. He had a flute, and a bundle of letters which showed that he came from Brighton. Both the others had documents showing they were stewards.

The Bench decided to dismiss the case on the ground of insufficient evidence, and in doing so the Chairman expressed the hope that it would be a warning to them, especially at this time, not to go about looking at tele graph wires, or they would find themselves where they they did not want to be. The officer acted quite rightly in arresting them and bringing them before the Court.

At a meeting of the Natal Co-operative Society, held in Durban, Lieut.-Col. T. Irvine-Smith, the director of the Johannesburg Municipal Abattoirs, gave figures with regard to the prices chilled or frozen meat would likely to fetch on the London market if sent from South Africa. The meeting was in favour of Natal taking a lead in the meat export trade, and seemed hopeful of making a beginning in the coming autumn.—*African World.*

ARMY VETERINARY SERVICE

Extract from *London Gazette*,

War Office, Whitehall, Aug. 14.

Regular Forces. Army Veterinary Corps.

The following to be Lieuts. (on probation): A. A. Fryer, S. O'Donel, R. M. Bamford, and V. Fox. Dated July 31.

Territorial Force. Army Veterinary Corps.

The following Lieuts. to be Capts.: R. D. Williams and H. Anthony. Dated April 22.

Aug. 18.

General Reserve of Officers.

Army Veterinary Corps.

The following to be Lieuts.: C. J. R. Lawrence, R. H. Knowles, J. G. T. Edwards, F. C. Minett, R. Daubney. Dated Aug. 4. M. G. O'Connell. Dated Aug. 5. P. T. Saunders. Dated Aug. 6. H. J. Lowe. Dated Aug. 19.

Territorial Force. Army Veterinary Corps.

Capt. T. H. Hobson to be Major. Dated Aug. 19.

To be Lieuts.: A. H. Adams, G. W. Bloxsome, J. R. Crane. Dated Aug. 19.

Personal.

Jack.—At Carlton Lodge, King's Lynn, on the 10th inst., to the wife of D. S. Jack, M.R.C.V.S., a son.

Mr. T. Dunlop Young, M.R.C.V.S., is acting veterinary officer to the 1st London Brigade, R.F.A., while Mr. King, one of his staff, is assistant meat inspector at sea with the Naval Volunteers.

The Late Mr. W. G. Burnett Dickinson, F.R.C.V.S.

We regret to record the sudden death of Mr. Walter George Burnett Dickinson, Wide Bargate, which occurred suddenly at Butterwick on Thursday afternoon, 6th inst. He was a well-known and highly esteemed Territorial officer, and a Major in the 1st Battery, 1st North Midland Brigade, R.F.A., and last week was employed in inspecting and purchasing horses in the district for the Government for purposes of the war. He was thus employed on Thursday morning, and was apparently in excellent health. In the afternoon he accompanied Lieut. Giles, the officer commanding, in a motor car to Mr. C. Hardy's farm at Butterwick. He had just completed a purchase and had returned to the car, when he was seized with sudden faintness and fell forward on his knees into Mr. Hardy's arms, and expired in a moment.

Mr. Dickinson was well known and respected in Boston, and much sympathy is felt for Mrs. Dickinson and her son, Mr. W. Stanley Dickinson, in their bereavement. Mr. Dickinson had for some been under the care of Dr. R Tuxford and Dr. Mason, and the

the former was able to certify that death was due to heart failure, and an inquest was avoided. Flags were raised half mast at the artillery barracks and at the Young Men's Institute, of which Mr. W. S. Dickinson is chairman, and of which the late Major Dickinson was a vice-president.

Mr. Dickinson was the son of the late Mr. J. C. Dickinson, M.R.C.V.S., of Wide Bargate, Boston (who was cousin of the late Professor John Gamgee), and was born on April 22nd, 1858. He was educated at Boston Grammar School and the Ecole Veterinaire, Alfort, Paris, and the New Veterinary College and Surgeon's Hall, Edinburgh. He was a Fellow of the Royal College of Veterinary Surgeons, a Fellow of the Royal Society, Edinburgh, and was prize essayist and gold medallist, Edinburgh, April, 1881. He succeeded to his father's business in 1881; was a man of rare judgment, most skilful operator, and of great artistic merit, and held several public appointments, including that of veterinary inspector to the Holland County Council under the Contagious Diseases (Animals) Act, and was veterinary adviser to the Royal, Alliance, and Yorkshire Insurance Companies. He was a past president and vice-president of the Lincs. Veterinary Medical Society, and the author of several professional works. His keenness and enthusiasm as a Territorial officer are well known. He joined the Boston battery as Veterinary Lieut. in 1902, and was promoted Captain in 1904, and gazetted Major a few years later. He was devotedly attached to the work, and was a very zealous as well as a highly popular officer. He was a Freemason, a past-master of the Harmony Lodge and P.Z. of St. Botolph Royal Arch Chapter. The funeral took place at Boston cemetery on Saturday afternoon, and was attended with military honours. A detachment of the R.F.A. (T.) attended under the command of Lieut. S. C. Wright, and representatives of the Ambulance Brigade, of which Mr. W. Stanley Dickinson is the commanding officer. There was a large number of wreaths and floral tributes of respect.

Lincolnshire and District Veterinary Medical Association.

One of the best known practitioners in the Eastern Counties passed away suddenly on August 6th, viz., Mr. Walter G. B. Dickinson, of Boston. Much regret is felt throughout a wide circle at the loss of one who was greatly esteemed socially and professionally. He was a man of a kindly and genial disposition, widely read and took a keen interest in all that concerned the advancement of the veterinary profession as well as in local matters. He held the rank of Veterinary Major in the Territorial Forces, was a keen churchman and most popular with all who knew him. They join with his widow and only son in mourning his loss at the comparatively early age of 57.

T. Hicks,
Hon. Sec. & Treas., Lincoln and District V.M.A.

THE URGENT CALL FOR VETERINARY SURGEONS.

Sir,

It is with emphasis that I write to "second" the idea promulgated by the letter of Mr. Trigger in your issue of the 15th inst. Great Britain is in absolute need of veterinary surgeons and the Army in particular calls at this moment for their services.

It is "an emergency." I am sure that I am voicing the whole profession when I say that the President of the R.C.V.S. should consider his right to put into force Bye-law 92 without delay.—Yours faithfully,

Frederick Hobday, F.R.C.V.S.

Kensington, W. Aug. 13.

Sir,

May I ask through the medium of your paper at this period when every man who is willing and able to serve his country should do so, are there not available a certain number of retired members of the profession too old for military work, but still capable of carrying on a practice. If these gentlemen would come forward and offer their services as "locums" for a considerable period they would then liberate many young experienced and capable veterinary surgeons so urgently needed in our Army and Territorial Forces.—Yours truly,

Jas. T. Angwin, M.R.C.V.S.

Arundel. Aug. 16.

Sir,

Mr. Trigger's letter is the only published intimation that I have seen that veterinary services are required in excess just now. As a small practitioner, under the age of 45, I should be pleased to offer my services if required to help at the present time in any capacity, for from 4 to 6 hours daily, and I am sure there are many who would do the same if they were given the chance.

It is particularly those in and near large towns who would, I think, be able to help if things are as Mr. Trigger suggests, and I should like to see something published in your journal to give those out of immediate touch with their professional colleagues some guide. I understand a circular was sent to some practitioners asking for their services in the event of mobilisation, but I, for one, did not receive one, and no doubt many more did not.

It is particularly galling that at the present time—if veterinary help is needed for the good of the State—the obscure are given no chance, just because they are overlooked.—Yours, etc.

An Unknown M.R.C.V.S.

TREATMENT OF FOALS—MORPHIA.

Sir,

I should like to thank Mr. H. C. Wilkie, F.R.C.V.S., F.Z.S., through the medium of your columns, for his kindness in replying (in your issue of June 27th) to my queries under the above heading.

I much appreciated reading his views on the subject, and consider it very good of him to have written and expressed them.—Yours faithfully,

C. H. H. Jolliffe, F.R.C.V.S.

Pickering, Ontario.
July 30.

COLONIAL APPOINTMENTS.

Sir,

The remarks of "Once bitten twice shy" are misleading, in his letter of July 11th, under the heading "Colonial Appointments." In the first place he speaks of Indian appointments only.

Secondly, he mixes up government service and private practice.

In his last paragraph he apparently considers R.500 a month a sufficient salary for service in India. There is no veterinary post in the Superior Service under the Government of India the initial salary in which is less than R. 500. This is not a great deal of money, but it is sufficient. As far as I know there is no M.R.C.V.S. serving in the Subordinate Service.

His remarks on private practice have considerable foundation on fact, but do not apply to all firms in the East carrying on a veterinary business in conjunction with dealing and jobbing, etc,

If a young M.R.C.V.S. who proposes to join one of these firms would write before doing so to the local Government veterinary officer, I am sure any such V.O. would tell him the character of the firm, and advise him as to whether the conditions and terms offered were fair and adequate.—I remain, yours truly,

"On the Spot."

July 30th.